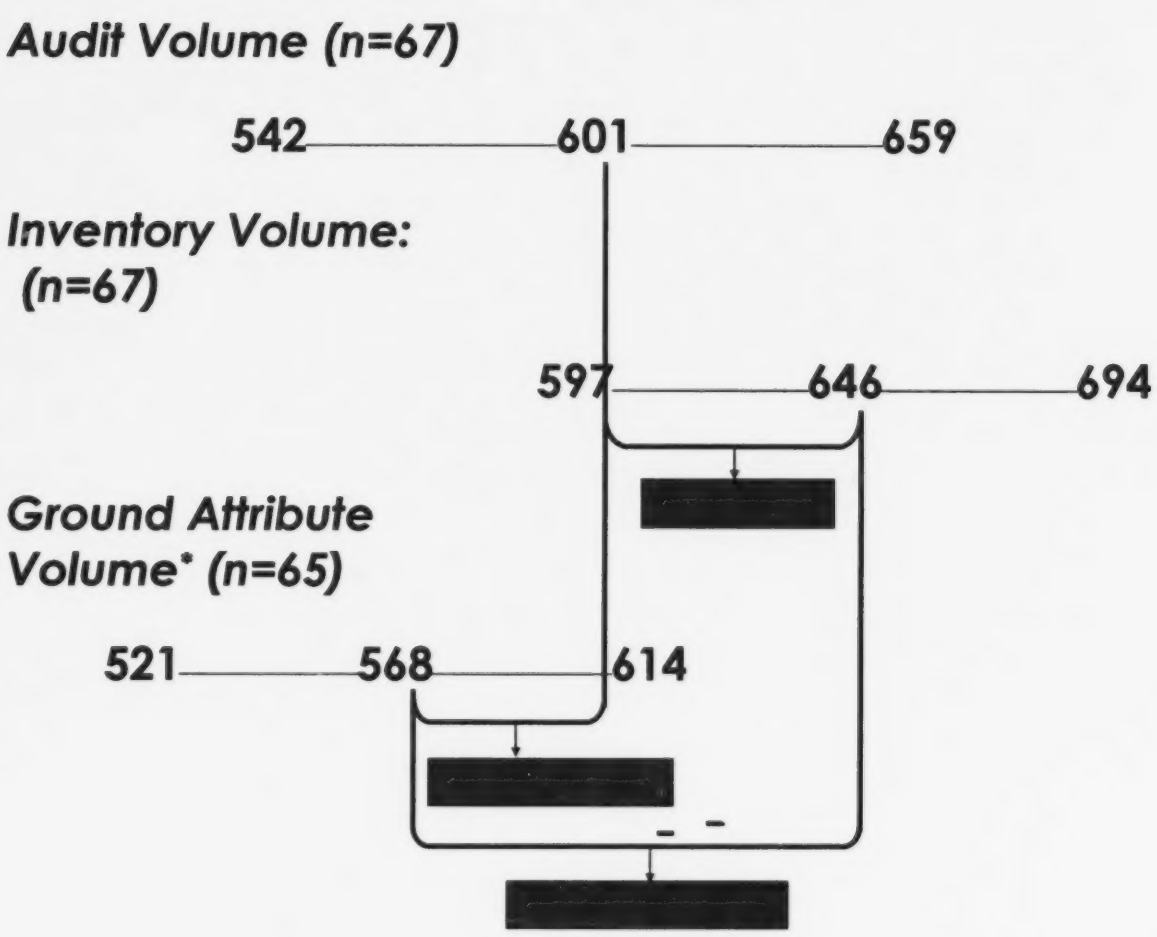
Inventory Audit Results:
Overview Queen Charlotte Islands TSA
March, 1998



* "Ground attribute" volume is calculated from audit sample attributes (i.e. "ground" attributes: stock and stand table estimates of species composition and stocking, and ground-based averages of top height and age), along with crown closure taken from the original map label, using the VDYP yield prediction model. The difference between the ground attribute volume estimate and the audit volume estimate *approximates* the bias associated with the yield model. The difference between the ground attribute volume estimate and the inventory volume estimate *approximates* the bias associated with the inventory classification attributes. These two bias components comprise the *total bias* in the inventory. Top heights and ages were not available for samples #3 and 14 hence ground attribute volume is based on 65 samples.

Audit Volume (Kozak) vs. Inventory Volume (Predicted in VDYP) (n=67)

1. Average Volumes/ha and Confidence Interval @ 95% *(Utilization level : 17.5 cm + net merch. less decay only/Tree Class 1,2)*

542 ——— 601 ——— 659 Audit Volume (9.8% sampling error)

597 ——— 646 ——— 694 Inventory Volume (map label attributes predicted in VDYP) (7.5% sampling error)

2. Ratio Analysis : Ratio of Means @95%

$R = \frac{\text{average audit volume}}{\text{average inventory volume}} = 0.93$

1.0 ↓

0.84 ——— 0.93 ——— 1.02

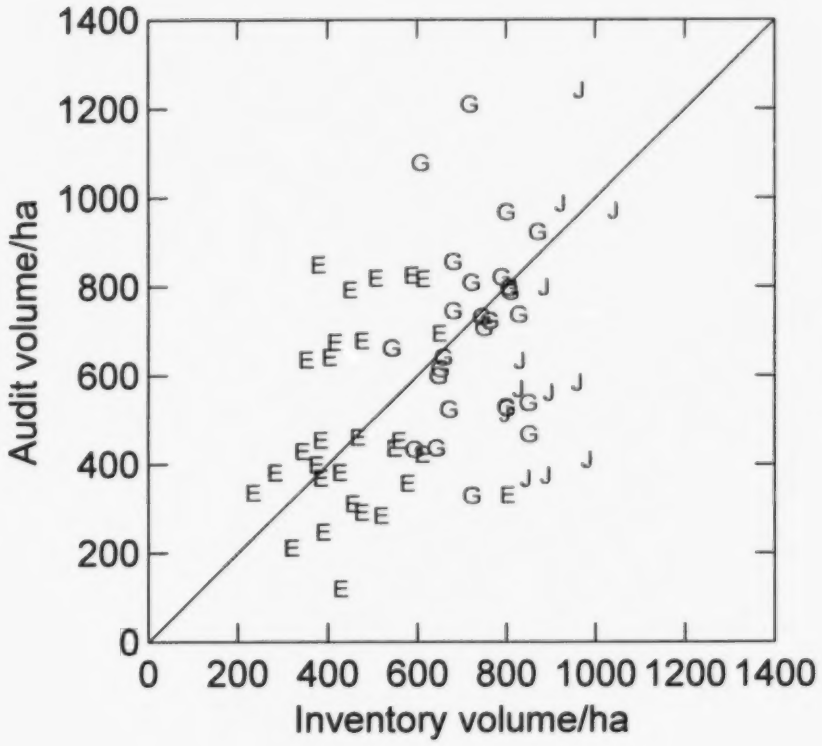
* *Since 1.0 is within the interval, the ratio indicates that there is no significant difference between the audit volume and the inventory volume.*

3. Paired T Test @ 95% (α=0.05) for all sample polygons
mean difference = -45.052 m^3/ha
p - value for mean difference = 0.130
**since p-value > α, the difference is not significant*

4. Paired T Test @ 95% for all sample polygons by map label GTG
There was a significant difference within GTG J.
(for GTG J: mean difference = -236.175 m^3/ha; p-value = 0.007; n=12)

5. Correlation @ 95% (α=0.05) for all samples
Correlation co-efficient r = 0.415
p value for correlation co-efficient = 0.001
∴ correlation is significant

QUEEN CHARLOTTE ISLANDS TSA Inventory Audit:
Audit Volume vs. Inventory Volume (by GTG)
(Tree Class 1 & 2, less decay only, 17.5cm + dbh)



Letter symbols correspond to map label GTG's as follows:

E	*Cw, Yc, CwFd, CwL, CwPy, Cw Pw, CwPl, CwDecid. CwH*	I	*pure S*
F	*H, HDecid.*	J	*SF, SH (and SC), SB*
G	*HFd, HL, HPy, HPw, HPl, HCw, HB, HS*	M	*Pl F, Pl S (and Pl B)*

Audit Volume (Kozak) vs. Ground Attribute Volume (Predicted in VDYP): *"VDYP model" bias (n=65*)*

1. Average Volumes/ha and Confidence Interval @ 95% *(Utilization level : 17.5 cm + net merch. less decay only /Tree class 1,2))*

541——602——662 Audit Volume (n=65) (10.0% sampling error)

521——568——614 Ground Attribute Volume (predicted in VDYP) (8.2% sampling error)

2. Ratio Analysis : Ratio of Means @95%

$$R = \frac{\text{average audit volume}}{\text{average ground attribute volume predicted in VDYP}} = 1.06$$

1.0
↓

0.99——1.06——1.13

* *Since 1.0 is within the interval, the ratio indicates that there is no significant difference between the audit volume and the ground attribute volume.*

3. Paired T Test @ 95% ($\alpha = 0.05$) for all sample polygons
mean difference = 34.188 m^3/ha
p - value for mean difference = 0.076
**since p - value > α, the difference is not significant*

4. Paired T Test @ 95% for all sample polygons by map label GTG
There was a significant differences within GTG E.
(for GTG E: mean difference = 66.64 m^3/ha; p-value=0.024; n=29)

5. Correlation @95%($\alpha = 0.05$) for all samples
Correlation co-efficient r = 0.780
p - value for correlation co-efficient < 0.001
.: correlation is significant

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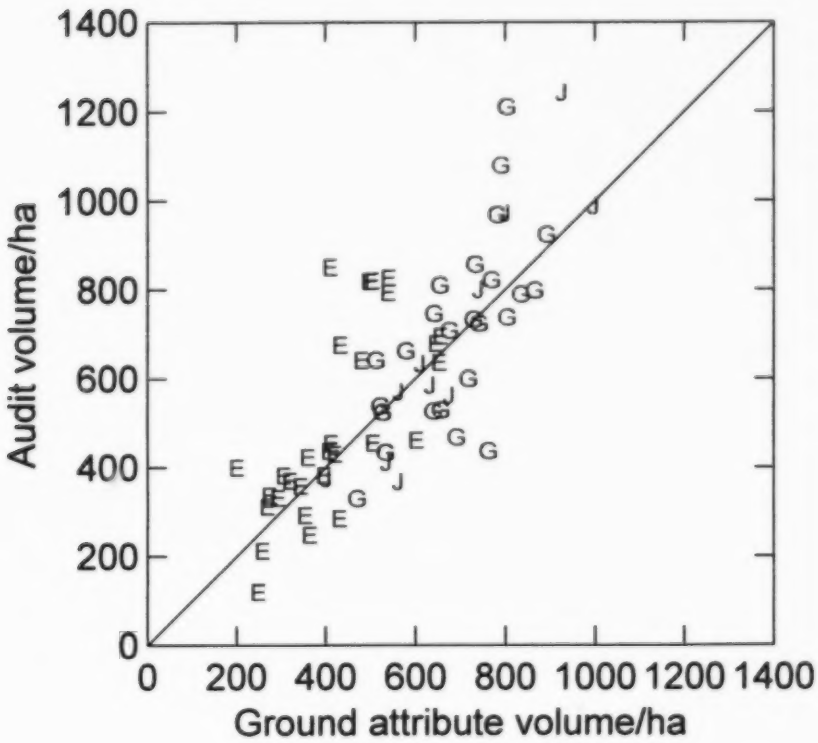
* Top heights and ages (and hence ground attribute volumes) were not available for samples #3 and 14. All statistics on this page are based on the 65 samples for which there are both an audit volume and a ground attribute volume.

QUEEN CHARLOTTE ISLANDS TSA Inventory Audit: Audit Volume (Kozak) vs. Ground Attribute Volume (Predicted in VDYP) by GTG

(Tree Class 1 & 2, less decay only, 17.5cm + dbh)



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F	*H, HDecid.*	J	*SF, SH (and SC), SB*
G	*HFd, HL, HPy, HPw, HPl, HCw, HB, HS*	M	*Pl F, Pl S (and Pl B)*

Ground Attribute Volume (predicted in VDYP) vs. Inventory Volume (predicted in VDYP): *"Attribute" Bias (n=65*)*

1. Average volumes/ha and confidence interval @ 95%

(Utilization level : 17.5 cm + net merch. less decay only, Tree Class 1,2))

521 —— 568 —— 614

Ground Attribute Volume
(predicted in VDYP)
(8.2% sampling error)

593 —— 643 —— 693

Inventory Volume (n=65)
(map label attributes predicted in VDYP)
(7.8% sampling error)

2. Ratio Analysis : Ratio of Means @ 95%

$$R = \frac{\text{average ground attribute volume (VDYP)}}{\text{average inventory volume (VDYP)}} = 0.88$$

1.0
↓

0.83 —— 0.88 —— 0.94

** The ratio indicates that there is a significant difference between the ground attribute volume predicted in the VDYP and the inventory volume predicted in the VDYP.*

3. Paired T Test @ 95% ($\alpha = 0.05$) for all sample polygons
mean difference = -75.669 m^3/ha
p - value for mean difference < 0.001
**since p - value < α, the difference is significant*

4. Paired T Test @ 95% for all sample polygons by map label GTG
There was a significant difference within GTG J.
(for GTG J: mean difference = -236.909 m^3/ha; p-value=0.001; n=11)

5. Correlation @95%($\alpha = 0.05$) for all samples
Correlation co-efficient r = 0.669
p - value for correlation co-efficient < 0.001
∴ correlation is significant

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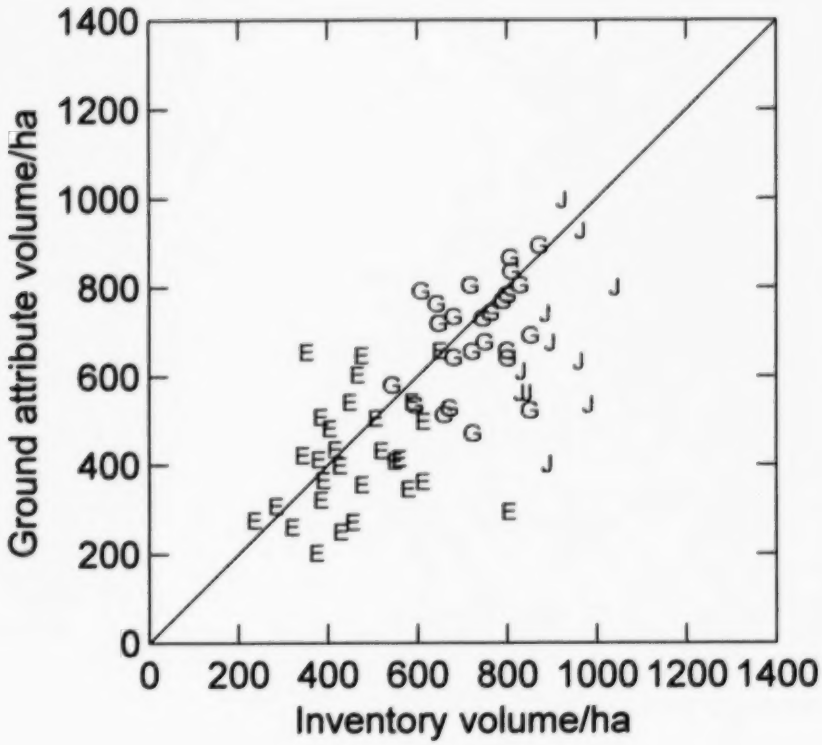
* Top heights and ages (and hence ground attribute volumes) were not available for samples #3 and 14. All statistics on this page are based on the 65 samples for which there are both an inventory volume and a ground attribute volume.

QUEEN CHARLOTTE ISLANDS TSA Inventory Audit: Ground Attribute Volume (Predicted in VDYP) vs. Inventory Volume (Predicted in VDYP) by GTG

(Tree Class 1 & 2, less decay only, 17.5cm + dbh)



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G	*HFd, HL, HPy, HPw, HPl, HCw, HB, HS*	M	*Pl F, Pl S (and Pl B)*

Audit (ground) height (m) vs. Inventory height (m) (n=65)*

1. Average heights and confidence interval @ 95%

29.9——31.9——33.8 Audit (ground) height (6.2% sampling error)

32.0——33.7——35.5 Inventory height (n=65) (5.2% sampling error)

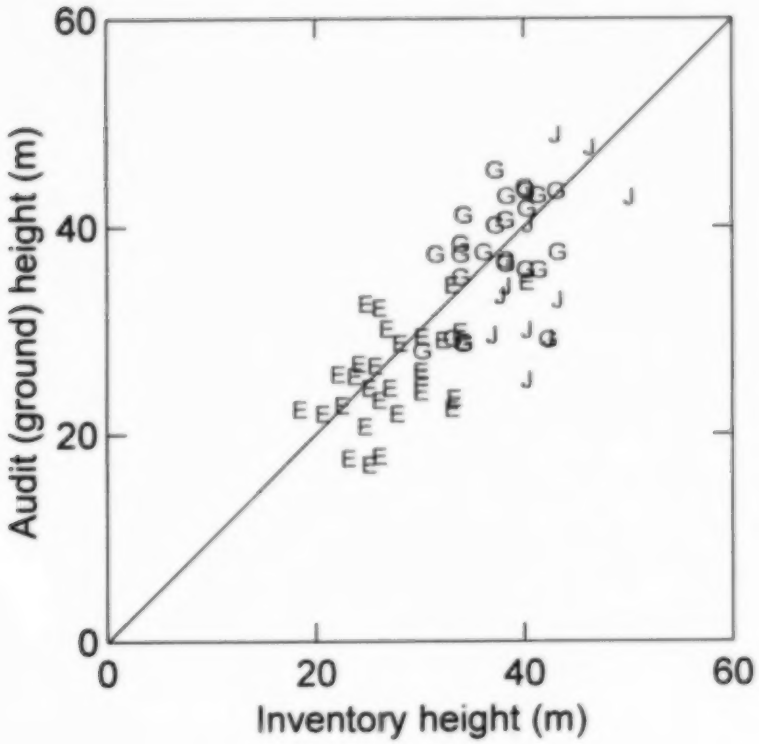
2. Paired T Test @ 95% ($\alpha = 0.05$) for all sample polygons (n=65)
mean difference = -1.88 m
p - value for mean difference = 0.007
**since p - value < α, the difference is significant*

3. Paired T Test @ 95% for all sample polygons by map label GTG
There were significant differences within GTGs E and J.
(for GTG E: mean difference = -1.98 m; p-value = 0.033; n=29
for GTG J: mean difference = -5.94 m; p-value = 0.012; n=11)

4. Correlation @95%($\alpha = 0.05$) for all samples
Correlation co-efficient r = 0.746
p - value for correlation co-efficient < 0.001
∴ correlation is significant

* There are 65 samples for which there are both inventory attributes (age and height) and valid ground top height and age data.

Queen Charlotte Islands TSA Inventory Audit:
Audit (ground) height vs. Inventory height by GTG



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F	*H, HDecid.*	J	*SF, SH (and SC), SB*
G	*HFd, HL, HPy, HPw, HPl, HCw, HB, HS*	M	*Pl F, Pl S (and Pl B)*

Audit (ground) age (yrs) vs. Inventory age (yrs) (n=65)*

1. Average ages and confidence interval @ 95%

220 —— 243 —— 266 Audit (ground) age
(9.4% sampling error)

262 —— 282 —— 303 Inventory age (n=65)
(7.3% sampling error)

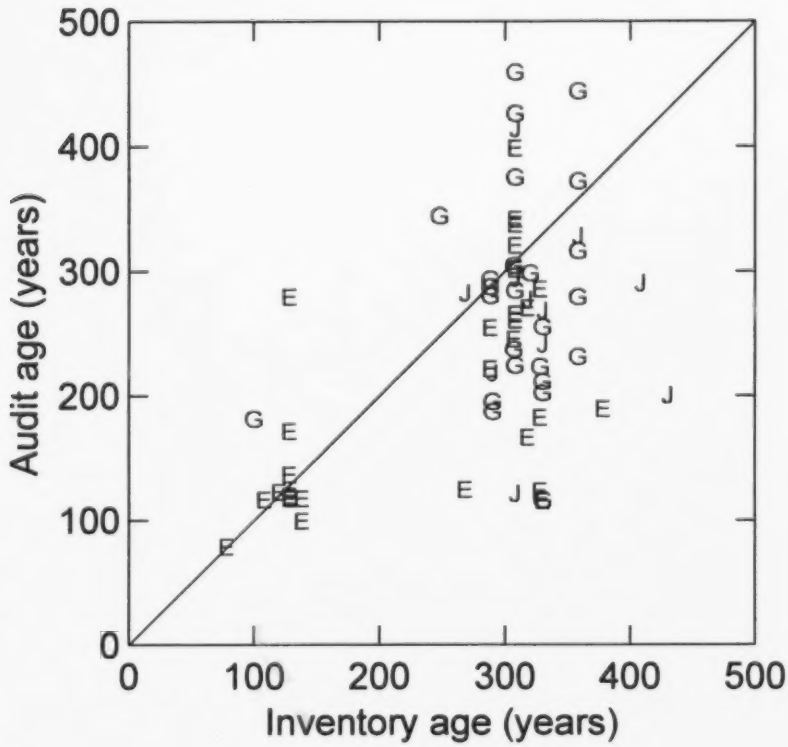
2. Paired T Test @ 95% (α = 0.05) for all sample polygons (n=65)
mean difference = -38.8 years
p - value for mean difference = 0.001
**since p - value < α, the difference is significant*

3. Paired T Test @ 95% for all sample polygons by map label GTG
There were significant differences within GTGs E and J.
(for GTG E: mean difference = -39 years; p-value = 0.021; n=29
for GTG J: mean difference = -66 years; p-value = 0.040; n=11)

4. Correlation @95%(α = 0.05) for all samples (n=65)
Correlation co-efficient r = 0.504
p - value for correlation co-efficient < 0.001
∴ correlation is significant

* There are 65 samples for which there are both inventory attributes (age and height) and valid ground top height and age data.

Queen Charlotte Islands TSA Inventory Audit:
Audit (ground) age vs. Inventory age by GTG



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F	*H, HDecid.*	J	*SF, SH (and SC), SB*
G	*HFd, HL, HPy, HPw, HPl, HCw, HB, HS*	M	*Pl F, Pl S (and Pl B)*

Inventory Classification Assessment

- 61% of the growth type groups from the inventory (ie. map labels) matched the audit growth type groups.
- the growth type group distribution for the 67 inventory audit samples is as follows (the bold italic entries on the diagonal in the table indicate a GTG match between the audit and the inventory):

Audit GTG	***Inventory GTG (columns)***						
(rows)	E	F	G	I	J	M	*total*
E	***22***	0	4	0	3	0	29
F	0	***0***	1	0	1	0	2
G	3	0	***18***	0	7	0	28
I	0	0	1	***0***	0	0	1
J	1	0	2	0	***1***	0	4
M	3	0	0	0	0	***0***	3
total	29	0	26	0	12	0	**67**

Letter symbols correspond to GTG's as follows:

E	*Cw, Yc, CwFd, CwL, CwPy, Cw Pw, CwPl, CwDecid. CwH*	I	*pure S*
F	*H, HDecid.*	J	*SF, SH (and SC), SB*
G	*HFd, HL, HPy, HPw, HPl, HCw, HB, HS*	M	*Pl F, Pl S (and Pl B)*